SUBSCRIPTIONS FOR 1937 NOW PAYABLE
Detachable Subscription Blank in this Number

ENTOMOLOGICAL NEWS

DECEMBER, 1936

Vol. XLVII No. 10

HENRY CHRISTOPHER MCCOOK,
1837-1911.

CONTENTS

Pierce—The Position of the Strepsiptera in the Classification of Insects 257
Abbott—On the Olfactory Powers of Megarhyssa lunator (Hymenoptera Ichneumonidae) 263
Swain—Notes on the Oviposition and Life-history of the Leafhopper Oncometopia undata Fabr. (Homoptera: Cicadellidae) 264
Strohecker—A New Timema From California (Orthoptera: Phasmidae) 267
Nash—Thysania zenobia in Maine (Lepid.: Noctuidae) 268
Meiners—Notes on Papilio asterius Cram. and a Record of var. americus Kollar. (Lepidoptera: Papilionidae) 269
Meserve—The Cicindelidae of Nebraska (Coleoptera) 270
Franclemont—A New Generic Name (Lepidoptera, Euchromiidae) . 275
Corrections for November, 1936, News 275
Entomological Literature 276
Entomological Literature, Special Notices 284

PHILADELPHIA, PA.
THE ACADEMY OF NATURAL SCIENCES,
Logan Square

Entered at the Philadelphia, Pa., Post Office as Second Class Matter.
Acceptance for mailing at the special rate of postage prescribed for in Section 1.
Act of October 3, 1917, authorized January 15, 1921

ENTOMOLOGICAL NEWS

published monthly, excepting August and September, by The American Entomological Society.

Philip P. Calvert, Ph.D., Editor; E. T. Cresson, Jr., R. G. Schmieder, Ph.D., V. S. L. Pate, Associate Editors.

Advisory Committee: Philip Laurent, J. A. G. Rehn, Chas. Liebeck, J. Chester Bradley, Ph.D., Frank Morton Jones, Sc.D., John C. Lutz, Max Kisliuk, Jr., Wm. W. Chapman.

The subscription price per year of ten (10) numbers is as follows:

United States and possessions, Central and South America $3.00, Canada $3.15, Foreign $3.25, Single copies 35 cents.

ADVERTISING RATES: Full width of page. Payments in advance.

One issue, 1 in.,	$ 1.20,	3 in.,	$ 3.00,	5 in.,	$ 5.00,	7 in.,	$ 7.00
Ten issues, "	8.00,	"	25.00,	"	45.00,	"	60.00

SUBSCRIPTIONS. All remittances and communications regarding subscriptions, non-receipt of the NEWS or of reprints, and requests for sample copies, should be addressed to

ENTOMOLOGICAL NEWS, 1900 Race Street, PHILADELPHIA, PA.

All complaints regarding non-receipt of issues of the NEWS should be presented within three months from date of mailing of the issue. After that time such numbers, if available, will be supplied only by purchase. Not more than two issues will be replaced gratis, through loss in transit or in change of address, unless such have been registered, at the subscriber's expense. No subscriptions accepted which involve giving a receipt acknowledged before a notary, except at the subscriber's expense.

MANUSCRIPTS AND ADVERTISEMENTS. Address all other communications to the editor, Dr. P. P. Calvert, Zoological Laboratory, University of Pennsylvania, Philadelphia, Pa.

TO CONTRIBUTORS. All contributions will be considered and passed upon at our earliest convenience and, as far as may be, will be published according to date of reception. The receipt of all papers will be acknowledged. Owing to the limited size of each number of the NEWS, articles longer than six printed pages will be published in two or more installments, unless the author be willing to pay for the cost of a sufficient number of additional pages in any one issue to enable such an article to appear without division. Proof will be sent to authors. Twenty-five "extras" of an author's contribution, without change in form and without covers, will be given free when they are wanted; if more than twenty-five copies are desired *this should be stated on the MS.*

No illustrations will be published in the NEWS for the present, except where authors furnish the necessary blocks (or pay in advance the cost of making blocks) and also pay for the cost of printing plates. No charge for printing text-figures. Information as to the cost will be furnished in each case on application to the Editor. Blocks furnished or paid for by authors will, of course, be returned to authors, after publication, if desired.

Stated Meetings of The American Entomological Society will be held at 8.00 P. M., in 1936, on the fourth Thursday of each month excepting June, July, August, November and December, and on the third Thursday of November and December.

Communications on observations made in the course of your studies are solicited; also exhibits of any specimens you consider of interest.

The printer of the "News" will furnish reprints of articles, without covers, over and above the twenty-five given free at the following rates: One or two pages, twenty-five copies, 35 cents three or four pages, twenty-five copies, 70 cents; five to eight pages, twenty-five copies, $1.40; nine to twelve pages, twenty-five copies, $2.00; each half-tone plate, twenty-five copies, 30 cents; each plate of line cuts, twenty-five copies, 25 cents; greater numbers of copies will be at the corresponding multiples of these rates. Printed covers for 50 copies, $4.00 or more, according to number of pages bound.

ENTOMOLOGICAL NEWS

VOL. XLVII. DECEMBER, 1936 No. 10

The Position of the Strepsiptera in the Classification of Insects.

By W. DWIGHT PIERCE, Ph.D., Philadelphia, Pennsylvania.

The systematic position of the Strepsiptera has been much debated, but it has been the most common practise to either include the group in the Coleoptera, or align it with the Coleoptera. I have maintained since 1909 that the Strepsiptera are not related to the Coleoptera and belong far from them in the classification. I wish at this time to reargue the question, adding new arguments to support my contentions, and this time suggesting rather definite affinities.

So far as I can find, the only reasons for placing them next to the Coleoptera are:

1. The Strepsiptera have only functional metathoracic wings, with mesothoracic balancers, which are supposed to be equivalent to Coleopterous elytra.

2. The Strepsiptera undergo a hypermetamorphic development analogous to that in the Rhipiphoridae.

3. The Strepsiptera and Rhipiphoridae have flabellate antennae.

These arguments are very superficial and not of very much value when judged from phylogenetic standpoints, because:

1. Balancers are possessed by the Diptera and Coccoptera, which are much more like those of the Strepsiptera, than are the elytra of Coleoptera and Dermaptera; with the difference however that the last three have these organs on the mesothorax, the first two on the metathorax. Tokunaga (1935. Phil. J. Sci. 56 (2): 127-214) in his description of the morphology of the Nymphomyiid fly, *Nymphomyia alba* Tokunaga, has figured a balancer, which more closely resembles the typical Strepsipterous balancer than anything else I have seen.

2. Hypermetamorphic development occurs in various families of Coleoptera (Micromalthidae, Rhipiphoridae, Meloidae); in some of the parasitic Hymenoptera; in the Neuroptera (Mantispidae); in the Aphidoptera; and the Strepsiptera.

3. Flabellate antennae occur in various families of Coleoptera, Hymenoptera, and Lepidoptera, and throughout the Strepsiptera. In fact nearly every Strepsipterous type occurs in the Hymenopterous Encyrtidae, and there is much greater resemblance here than between Rhipiphorid and Strepsipteran antennae.

Thus it can be seen that the usual arguments for placing with or near the Coleoptera are not arguments at all.

To place the Strepsiptera we must look at more fundamental questions.

In ordinal classification of insects the dominant characters used are metamorphosis, wings, mouthparts, thoracic structure, leg segmentation, and nervous system, and probably, other internal structures should be given more attention. The Strepsipterous insects have a hypermetamorphic development, metathoracic wings, mesothoracic balancers, nonagglutinate thorax, with the metathorax preponderant, legs with from six to nine segments due to reduction of the tarsus, and a three ganglion nervous system. We will look into some of these points.

I. 1. Wings are possessed more or less by all orders, except the primitive Archaeognatha, Zygentoma, Protura, Collembola, Dicellura and Rhabdura, and the parasitic degenerated orders Mallophaga, Anoplura and Siphonaptera. Winglessness occurs however in Blattida, Mantida, Corrodentia, Isoptera, Coleoptera, Hymenoptera, Panorpatae, Diptera, Hemiptera, Homoptera, Aphidoptera, and always in female Coccoptera and Strepsiptera. In most of these winged orders, winglessness is a sporadic occurrence, usually due to parasitism, or to underground life.

2. Wings with simple veins and no cells are characteristic only of Aleurodoptera, Coccoptera, and Strepsiptera. In all other orders there is multiplicity of veins, with branches and cells, with the simplest veining in the Psylloptera. Those en-

tomologists who have given most attention to the study of fossil insects and to insect phylogeny place a great deal of stress on the phylogenetic importance of wing venation. Certainly, the venation in these three orders is of a type by itself.

3. Only two functional metathoracic wings and mesothoracic elytra characterize Orthoptera, Dermaptera, and Coleoptera; only two functional metathoracic wings and mesothoracic balancers characterize Strepsiptera; only two mesothoracic wings and metathoracic balancers characterize Coccoptera and Diptera.

II. The mouthparts of insects may be aligned into two categories with various subdivisions.

1. There are those with sucking mouthparts in all stages: Protura, Hemiptera, Homoptera, Thysanoptera, Anoplura, Psylloptera, Aleurodoptera, Aphidoptera and Coccoptera.

2. There are those with retracted mouthparts, but with distinct mandibles, such as Collembola, larval Diptera, and larval Strepsiptera. In the Diptera, the adult mouthparts are sucking, in the Strepsiptera non-functional, but mandibulate.

3. The other orders are characterized at least in the larval stage by external mandibles, and in the majority the adults also have functional mandibles; but in the Trichoptera and Lepidoptera the mandibles become non-functional, and the mouthparts are developed for sucking.

III. 1. In thoracic structure, the insect orders begin with those having non-agglutinate subequal thoracic segments; and here we may place the wingless Archaeognatha, Zygentoma, Protura, Collembola, Dicellura and Rhabdura.

2. The development of wings brought about thoracic modifications to strengthen the wing mechanism. These modifications are in two directions: agglutination of thoracic sclerites, and enlargement of one or more thoracic segments.

3. Agglutination of pro-, meso-, and meta-thorax, or of two of the three, occurs in all of the orders but two, the Aleurodoptera and Strepsiptera. In the former the mesothorax and the metathorax are both greatly enlarged, and each bears a pair of wings, and the notum of each clearly differentiates praescutum, scutum, scutellum, postlumbium and postscutellum. In

the Strepsiptera only the metathorax is greatly enlarged, as it alone bears wings, and its notum is characterized by clear differentiation of the same sclerites as in Aleurodoptera. It is interesting to note that the mesothorax in Coccoptera and at least in the Dipterous Nymphomyiidae is strictly homologous with the Aleurodopterous mesothorax and the Strepsipterous and Aleurodopterous metathorax, although in these two orders the metathorax is so reduced as to be only a leg-bearing segment, with balancers. In the Aleurodoptera and Strepsiptera the prothorax is small and much as in the primitive orders.

4. The agglutination of the entire thorax into a strong wing-bearing mass occurs in a number of orders, in all of which the prothorax is very small, and the other two parts are enlarged. This agglutination is simplest in Anoplura. In Coccoptera and Diptera, the mesothorax is dominant, and is the only wing bearing segment. In Odonata, Plecoptera, Neuroptera, Megaloptera, Raphidioptera, Mecaptera, Trichoptera and Lepidoptera, the mesothorax and metathorax are subequal, or the metathorax is in the ascendency; these are all four-winged. The Hymenoptera have gone still farther and the first abdominal segment is agglutinate to the thorax, otherwise the order belongs with the Neuroptera group just mentioned.

5. In the remaining orders the prothorax is emphasized and free, and the mesothorax and metathorax are agglutinate: Mantodea, Blattaria, Ephemerida, Phasmida, Orthoptera, Thysanoptera, Hemiptera, Homoptera, Isoptera, Embiida, Corrodentia, Mallophaga, Dermaptera and Coleoptera.

IV. The Strepsiptera are characterized by pupation within the last larval skin, or puparium; this is also characteristic of Aleurodoptera and appears in some Coccoptera, and in all Diptera Brachycera. In Aleurodoptera, Brachycera and Strepsiptera there is a detachable cephalotheca permitting emergence.

V. The Strepsiptera give birth to living young. This also occurs in Aphidoptera, Coccoptera, some Diptera Brachycera, and perhaps in other orders. These young strepsipterons are of campodeoid form, greatly resembling the larvae of Coccoptera and Aleurodoptera, and are possibly homologous to the first larvae of Rhipiphoridae and Meloidae in Coleoptera.

VI. With the exception of the most primitive Strepsiptera, *Eoxenos,* in which the female is legged and resembles a female coccid, the females are legless and permanently parasitic; they are wingless, as are all female Coccoptera, and many female Aphidoptera. The male Strepsiptera and Coccoptera (usually) are winged and legged, and alone of importance phylogenetically in placing their orders in the system. It is really sad that students of the coccids have devoted practically all of their time to the females.

VII. In the male Strepsiptera the anus is on the tenth segment which appears as a dorsal flap overhanging the projecting ninth with its aedeagus appendage. A very similar and strictly homologous genital apparatus appears in the Psylloptera and in the Nymphomyiidae of Diptera Nematocera.

VIII. The interesting raspberry eyes, with separate ommatidia, so characteristic of Strepsiptera, are found also in the Diptera, Nymphomyiidae, and Cecidomyiidae; in Aphidoptera, Chermesidae; in Coccoptera, *Drosichoides haematoptera;* in Thysanoptera, *Aeolothrips;* and in Trilobita, Phacopidae; in some Chilopoda and Isopoda. Incidentally let us note at this point the great resemblance between the mesothoracic wing of Nymphomyia and a Thysanopteran wing.

IX. There is a greater significance to ordinal classification in the nervous system than has been commonly brought out, and may we not hope that some student will take up the phylogeny of the insect nerve cord. The primitive nervous system consists of a brain with protero-, deutero-, and triterocerebrum, suboesophageal ganglion, and a double ventral nerve cord with segmental ganglia in each segment of thorax and abdomen. The trend is toward union of ganglia. In Machilis and Isoptera, and other insects, the last abdominal ganglia are united. There may be considerable range of different degrees of union of ganglia in an order, and yet I believe there are definite ordinal trends. The only nervous system of Plecoptera, which I have seen figured is of the primitive type. In many insects there is a strong thoracic ganglion. In the Coleoptera, in which the prothorax is not agglutinate to the meso-metathorax, we find

(*Melolontha vulgaris, Acilius sulcatus, Lucanus dama*) that the prothoracic ganglion is separate from the meso-metathoracic ganglion. In Orthoptera (*Melanoplus spretus*) which is more primitive than the Coleoptera but of the same type of thoracic agglutination, the prothoracic ganglion is distinctly separate, and the mesothoracic and metathoracic are approximate, yet distinct. Now when we come to the Hymenoptera, with agglutinate thorax and first abdominal, we find a similar agglutination of the four ganglia in *Formica rufa*. The Strepsiptera have definitely the suboesophageal, thoracic and first abdominal ganglia united into a thoracic mass, and the remainder of the abdominal ganglia united into one mass. In Coccoptera (*Aonidiella citrina*) and in Diptera (*Sarcophaga carnaria*) we find the extreme condensation with only a brain and a thoracic ganglion into which are fused the suboesophageal, thoracic and abdominal ganglia.

X. The female Strepsiptera have median unpaired tubes leading into a duct between the adult body and the uncast larval skin, with exit in the cephalothorax, for emergence of young. There is no known homologue of this structure.

XI. The Strepsipterous tarsi are always provided with the same number of joints on each pair of legs; although there are those with five joints and claws (primitive type), four joints, three joints, and two joints without claws. Thus the Strepsiptera parallel the tarsal arrangements of the Coleoptera, except that there are no heteromerous Strepsiptera. The common practise of aligning Strepsiptera with heteromerous Coleoptera is entirely without good phylogenetic foundation.

XII. The first larval form of the Strepsiptera is homologous to that of the worms Echiurida, many Isoptera, Symphyla, Thysanura, Rhabdura, Aleurodoptera and Coccoptera.

XIII. In the crustacean Entoniscidae with homologous larvae we find parasitic sac-like females, and so do we in Coccoptera.

The arguments given above show that the Strepsiptera possess distinct ordinal characteristics, but also show definite homologies to other orders, and mostly to Psylloptera, Aleu-

odoptera, Coccoptera, and Diptera, and furthermore that they cannot be considered as belonging to the same phylogenetic line as the elytrophorous Coleoptera.

We find that the Coccoptera, Diptera and Strepsiptera form a group of orders with two wings and two balancers; that they more or less transform within a puparium; that larvigenesis is a phenomenon found in all three; that wingless females are found in all three. They might therefore be classed as dipteroid, pupariate.

The distinct resemblances of Coccoptera and Diptera cause us to wonder whether the so-called relations of Diptera and Mecaptera are correct.

On the Olfactory Powers of Megarhyssa lunator (Hymenoptera: Ichneumonidae).

By C. E. Abbott, Chicago, Illinois.

When a female specimen of *Megarhyssa lunator* is about to emerge from pupation, the males, which have previously emerged, gather on the trunk of the tree in numbers and await her coming. If, as often occurs, several females appear on successive days, the male insects may hover about for as much as two weeks. It was this behavior that made possible the following series of tests.

I wanted to determine whether or not the antennae of the male insects function in bringing the sexes together. Since it is not certainly known what senses aid the suitors, it may be assuming too much to say that the sense is olfactory, yet because, in the case of many insects, it has been so considered, and since, further, this sense has been relegated to the antennae, it seemed well to ascertain what effect upon mating the elimination of the antennae might have.

The insect about to be treated was placed in a test tube with the protruding antennae held in place by a paraffined cork stopper. The protruding organs were then sprayed with ethyl chloride until their stiffness indicated that they were frozen. A little of the chemical usually got into the test tube, partially

anaesthetizing the insect, which, however, soon recovered sufficiently to fly away. If the specimen did not fly away it was deposited about half a block from the "home tree." In order to certainly identify them, the treated specimens all had the tips clipped from the first pair of wings. This did not interfere with flight, nor in any other way effect the behavior of the insects.

Experiments were conducted over a period of about two weeks, and sixteen specimens were treated. Nearly an equal number were left untreated for comparison. Every day following treatment, the number of treated specimens returning was noted.

Eleven returns were recorded for treated specimens. There was no way of accurately determining whether these were actually separate insects or a smaller number "repeating." But at least four treated specimens returned at one time. The fact that a treated specimen returned several times would, in itself, be of significance, since it would tend to indicate that such returns were not a matter of accident.

Although the results given are meager, they do seem to indicate that the antennae of Megarhyssa are of doubtful value in bringing about mating. The function of these antennae as olfactory organs is also doubtful. This is significant when we consider that the Hymenoptera are usually exploited as the best examples of insects exhibiting an antennal olfactory sense.

These results do not invalidate the conclusions drawn from tests made on ants and bees, which, after all, may differ considerably from Megarhyssa in the disposition and use of olfactory organs.

Notes on the Oviposition and Life-history of the Leafhopper Oncometopia undata Fabr. (Homoptera : Cicadellidae).

By Ralph B. Swain, Department of Entomology and Zoology, Colorado State College, Ft. Collins, Colo.

Several times in the literature on Cicadellidae mention has

been made of the peculiar white deposits taking the form of raised spots or blotches frequently found one on each elytron, at or near the centre of the anterior margin. I believe that no explanation for the occurrence of these structures has ever been offered. Riley and Howard (Insect Life V, pp. 150-154, 1892-93) writing of *Homolodisca coagulata* Say, state regarding the elytron that: "There is a large reddish blotch just beyond the middle and near the anterior border. Fresh females often have a white powdery spot superimposed upon this reddish spot. This white spot is easily rubbed off, and is not apparent after the insect is a few days old. It is probably waxy in its nature." I have frequently observed the chalky spots on the elytra of members of the genera *Scaphoideus* and *Platymetopius*. The following resumé of some life-history studies, carried on at the Bureau of Entomology field laboratory, Webster Groves, Mo., in 1933, explain, I believe, the use, if not the origin of the structure in *Oncometopia undata* Fabr., and may indicate its use wherever it appears.

In the case of *O. undata*, at any rate, the white deposits are shown not to be mere ornaments. One female, caged in a celluloid cylinder on a sunflower plant and observed at two different times in the act of oviposition, accomplished the task in the following manner. Resting head downward on the stem of the plant, she punctured the epidermis with her ovipositor and thrust it in and under to the right. On withdrawal of the ovipositor, a long cylindrical egg, about two millimeters in length could be seen under the thin plant skin, the whole appearing as a whitish blister. Then the metathoracic legs were brought up and together over the elytra. On the down stroke the distal ends of the tibia with their spurs and spines were scraped against the chalky deposits, some of the material being removed and applied to the plant skin over the egg. Here the fine particles were held by the rather sticky epidermal hairs. This performance was repeated until there resulted a patch of six to perhaps twenty eggs, all laid closely side by side, and all neatly powdered. A new incision was made for the admittance of each egg. On the following day, fresh deposits might be

on the elytra, and within a day or two a new egg scar would be found on stem or leaf petiole of the enclosed food plant.

A female, seen at one instant to be unspotted, five minutes later had light grey opaque liquid drops in place on the elytra. These hardened and became the familiar white deposits within another five minutes. I believe that the liquid must be transferred to the elytra by the hind tibia, and that it must come from the anus. But it is not the ordinary honey dew. The droplets of honey dew, ejected in quick succession from the anus while the insect is feeding, will not on evaporation, produce nearly so much residue per volume. The liquid must be a honey dew concentrate or come from another source. The purpose of the powder coating over the egg scar would seem to be camouflage, to hide the eggs from parasites or predators.

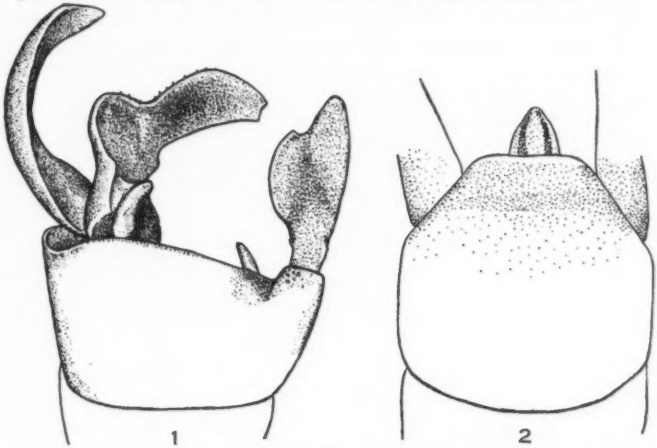
Some observations of the life-history are prompted by field and cage records. In about four days after being laid, the eggs show yellow spots at the ends nearest the laying-punctures, due to the development of the embryonic eyes. The colour darkens through orange to light reddish brown. In seven to ten days after oviposition a long-legged, big-headed nymph squirms out through the puncture and begins to feed. There are five nymphal stadia at the latitude of St. Louis. The time required for growth from egg to adult under out-door cage conditions was approximately seventy-five days. If, as I believe, the species hibernates in the adult stage, and oviposition in the spring begins before the middle of April, then there is probably time for only two full generations. Females were captured which at once laid fertile eggs, copulated at least once with caged males, and continued ovipositing over the space of a month. This can account for the fact that the broods are rather poorly defined.

The writer is greatly obliged to Mr. A. F. Satterthwait of the field laboratory of the Bureau of Entomology at Webster Groves, Mo., for the use of laboratory space and equipment and much kind advice.

A New Timema From California (Orthoptera : Phasmidae).

By H. F. STROHECKER, Department of Zoology, University of Chicago.

This aberrant genus, erected by Scudder in 1895 [1] for the single species *californica,* has been sufficiently characterized by Caudell in 1903 [2] and by Hebard, who in 1920 [3] added a second species, *chumash,* from Los Angeles County, California.



Timema podura sp. n. Fig. 1. Apex of abdomen of ♂ x 30. Fig. 2. Penultimate abdominal segment of ♀, Dorsal view x 30.

Among a small lot of Orthoptera recently received from Mr. A. T. McClay of Hollywood were sixteen specimens of *Timema,* two males and two females of which are *californica.* The remaining twelve specimens are of a species evidently undescribed as yet. Of these four males and six females bear the label "Sequoia National Park, California, May 24, 1929," and one male and one female are labeled "Greenhorn Mt., California, May 17, 1930."

The asymmetrical abdominal appendages of the males, the

[1] Can. Ent., XXVII, p. 30.
[2] Proc. U. S. Nat'l. Mus. XXVI, p. 883.
[3] Ent. News, XXXI, p. 126.

three-jointed tarsi, ventrally attached legs and general habitus refer this species without question to the genus *Timema* of Scudder.

Timema podura sp. n.

Male (*Type:* Sequoia National Park, CALIFORNIA).

More robust than *californica,* antennae and legs stouter than in that species. Vertex and pronotum smooth, without the low tubercles present in *californica.* Sinistral cercus broad, weakly bifid, somewhat concave above, evenly convex below, with a small basal tooth. Dextral cercus not bifid as in *californica* and *chumash.* Intercercal plate exceptionally large, foot-shaped, concave above. Color tawny with parallel rows of fuscous spots, the general pattern recalling that of *Anisomorpha.*

Female (*Allotype:* Sequoia National Park, California).

Differing from *californica* in coloration, which is similar to that described for the male. Penultimate tergite posteriorly truncate, the angles rounded. Posterior margin not at all emarginate.

Measurements in Millimeters.

Males	Length of Body	Length of Pronotum	Width of Pronotum	Length of caudal tibia
Sequoia Nat'l Park	13.7	2.1	2.9	3.2
" " "	13.5	2.1	2.9	3.1
" " "	13.7	2.0	2.9	3.1
" " "	14.0	2.1	2.9	3.2
Greenhorn Mt.	13.0	2.1	2.7	3.0
Sequoia Nat'l Park	18.4	2.7	3.2	3.4
" " "	18.9	2.5	3.2	3.7
" " "	22.0	2.9	3.9	4.2
" " "	19.4	2.7	3.8	4.0
" " "	18.5	2.6	3.5	3.8
" " "	19.0	2.7	3.6	3.5
Greenhorn Mt.	18.4	2.7	broken	3.8

One male and one female labelled "type" and "allotype" respectively will be deposited in the U. S. National Museum. A pair of paratypes has been placed in the Hebard collection in Philadelphia.

Thysania zenobia in Maine (Lepid.: Noctuidae).

The Noctuid moth *Thysania zenobia* Cramer was taken in Augusta, Maine, October 14, 1936. The moth was found on the ground in a lively condition.—ROBLEY W. NASH, State of Maine Forest Service, Augusta.

Notes on Papilio asterius Cram. and a Record of var. americus Kollar. (Lepidoptera: Papilionidae).

By Edwin P. Meiners, M. D., St. Louis, Missouri.

Papilio asterius Cram. is triple-brooded in the vicinity of St. Louis, Missouri, but at no time is it a common butterfly on the wing. The caterpillars are at times found in numbers feeding on carrots and parsley and the rearing of these offers the best opportunity of obtaining specimens. The species overwinters in the chrysalis stage, emerging in April and early May. Such specimens from overwintering chrysalids are somewhat smaller than those of the summer broods, though not as markedly so as in some of our other Papilios. The spots of the yellow bands are somewhat restricted in size and there is usually an absence of the discal spot in the bands of the secondaries, as in variety *curvifascia* Skinner. I have never seen any specimens of this variety in the summer broods taken here.

There is one specimen in my collection in which the yellow bands of the secondaries cover the entire discal area. Except that the ground color is a deep black and the yellow markings are of the usual normal shade, it pretty well matches the figure of *P. americus* Kollar in the revised edition of Holland's Butterfly Book. This specimen emerged April 9, 1910, along with normal specimens reared from larvae taken on parsley at Troy, Illinois. According to Holland there are apparently only two records of *P. americus* having been taken in North America, both of these being from Arizona. The one figured by Holland was taken by the Wheeler Expedition, the other is recorded by Barnes and McDunnough in Cont. N. H. Lep. N. A., III, 1916. I had long considered the specimen in my collection as an unnamed aberration, until it was recently examined by Dr Austin H. Clark, who considered it the same as *P. americus*. It is interesting to note that this form emerged from the spring brood which normally produces forms having the yellow bands more restricted than in the normal forms.

The Cicindelidae of Nebraska (Coleoptera).

By F. G. MESERVE,

Sioux Falls College, Sioux Falls, South Dakota

This paper is a list of the tiger beetles that occur in Nebraska. Data concerning geographic and seasonal distribution are given. The material, unless otherwise indicated, is in the permanent collection of the Department of Entomology of the University of Nebraska. This collection contains 4,031 specimens from North America, which belong in four genera and 128 species and varieties. It has recently been greatly augmented by the addition of several thousand specimens from the collection of the late Professor Robert H. Wolcott, of the University of Nebraska. There are 2,706 specimens from Nebraska, belonging in three genera and including fifty-nine species and varieties. The nomenclature used is that of Leng's "Catalogue of the Coleoptera of North America, North of Mexico."

The writer wishes to acknowledge valuable assistance and suggestions given by Professors M. H. Swenk, D. B. Whelan and Raymond Roberts and Mr. O. S. Bare, extension entomologist, all of the Department of Entomology of the University of Nebraska, and Messrs. Warren Knaus, of McPherson, Kansas, and C. H. Bratt, of Bennet, Nebraska.

1. AMBLYCHEILA CYLINDRIFORMIS (Say). Scarce. Extreme western part of state. Scotts Bluff County, July 19, one female, taken by L. M. Gates.

2. TETRACHA VIRGINICA (Linn.). Scarce. Extreme southeastern and southwestern portions of state. Gage, Lancaster and Dundy counties. July 24 to October 4, 37 specimens.

3. CICINDELA FORMOSA Say. Common. Generally distributed throughout the state. April 19 to September 20, 274 specimens.

4. C. FORMOSA GENEROSA Dej. Scarce. Extreme northwestern part of state. One specimen taken in Sioux County. May.

5. C. FORMOSA LATECINCTA Lec. (*fide* Leng). Scarce. None in Nebraska collection.

6. C. LENGI W. H. Not widely distributed. Central and western portions of state. April 16 to September 4, 42 specimens.

7. C. LIMBATA Say. Not widely distributed. Rather common in the north-central portion of state. Cherry, Holt and Thomas counties. May 24 to August 25, 123 specimens.

8. C. PURPUREA Oliv. Scarce. Extreme eastern portion of state. Lancaster and Cass counties. February 24 (collected in clay pit) to September 19, 16 specimens.

9. C. PURPUREA AUDUBONI Lec. Scarce. Lancaster, Holt and Sioux Counties. February 24 (collected in clay pit) to June 18, 10 specimens.

10. C. PURPUREA GRAMINEA Schp. Scarce. Cass, Saunders, Custer, Lancaster, Dawes and Sioux counties, March 17 to September 27, 33 specimens.

11. C. SPLENDIDA Hentz. Not widely distributed. Recorded from Douglas, Cass, Saunders, Lancaster and Antelope counties. February 15 (collected in clay pit) to October 13, 137 specimens.

12. C. SPLENDIDA DISCUS Klug. (*fide* Leng). Scarce. None in Nebraska collection.

13. C. SPLENDIDA TRANSVERSA Leng. Scarce. Extreme eastern part of state. Lancaster, Douglas and Cass counties. February 24 (collected in clay pit) to September 22, 31 specimens.

14. C. SPLENDIDA DENVERENSIS Csy. Not very common. Recorded from Douglas, Custer, Thomas, Cherry, Dawes and Sioux counties, April 16 to September 3, 32 specimens.

15. C. SPLENDIDA CONQUISITA Csy. (*fide* Leng). Scarce. None in Nebraska collection.

16. C. SPLENDIDA OREADA Csy. (*fide* Leng). Scarce. None in Nebraska collection.

17. C. LIMBALIS Klug. Relatively common. Eastern portion of state. Douglas, Cass, Nemaha, Lancaster, Cuming and Hamilton counties, March 1 to October 21, 72 specimens.

18. C. LIMBALIS AMOENA Lec. (*fide* Leng). Scarce. None in Nebraska collection.

19. C. DECEMNOTATA Say. (*fide* Schaupp*). Scarce. None in Nebraska collection.

20. C. DUODECIMGUTTATA Dej. Scarce. Lancaster County, March 29 to October 8, 32 specimens.

21. C. REPANDA Dej. Common throughout the state. April 11 to October 30, 206 specimens.

22. C. HIRTICOLLIS Say. Scarce. Scattered portions of state. Lancaster Knox, Dundy and Cherry counties, May 14 to September 11, 14 specimens.

* Schaupp, F. G. 1883. Synoptic tables of Coleoptera. Cicindelidae. Bull. Br. Ent. Soc., 6:73-124.

23. C. HIRTICOLLIS PONDEROSA Thoms. Rather common throughout central and eastern portions of state. April 22 to August 10, 69 specimens.

24. C. TRANQUEBARICA Hbst. Common in eastern part of state. Scarce in central and western portions. Douglas, Lancaster, Custer, Cuming and Cherry counties, March 17 to September 22, 70 specimens.

25. C. TRANQUEBARICA VULGARIS Say. Scarce. Lancaster County, May 7, one specimen.

26. C. TRANQUEBARICA OBLIQUATA Dej. Not very common. Scattered points in western half of state. Scarce in eastern half. Lancaster, Holt, Thomas, Hitchcock, Dundy, Scotts Bluff, Dawes, Franklin and Sioux counties. February 24 to September 15, 15 specimens.

27. C. TRANQUEBARICA HORICONENSIS Leng. Scarce. Lancaster County, April 29 to September , 3 specimens.

28. C. LONGILABRIS Say. Scarce. Lancaster County, July 28, one specimen.

29. C. LONGILABRIS MONTANA Lec. Scarce. Sioux County, June, one specimen.

30. C. LONGILABRIS NEBRASKANA Csy. Scarce. Sioux County, June 28 to August 20, 3 specimens.

31. C. FULGIDA Say. Common in eastern portion of state. Scarce in western portion. Lancaster, Saunders, Dundy and Morrill counties, April 14 to October 15, 163 specimens.

32. C. PULCHRA Say. Scarce. Lancaster and Dundy counties, May 24 to August 11, 10 specimens.

33. C. SCUTELLARIS Say. Not very common. Taken at scattered points in eastern, central and southern parts of state, April 9 to September 20, 36 specimens.

34. C. SCUTELLARIS LECONTEI Hald. Douglas, Cass, Lancaster, Saunders, Cuming, Thomas and Cherry counties, April 2 to November 3, 123 specimens.

35. C. SCUTELLARIS NIGRIOR Schp. Scarce. Sioux County, August 19 to August 26, 2 specimens.

36. C. SCUTELLARIS MODESTA Dej. (*fide*. Horn*). Scarce, none in Nebraska collection.

37. C. SEXGUTTATA Fab. Not very common. Douglas and Lancaster counties, May 28 to September 23, 27 sepecimens.

38. C. SEXGUTTATA TRIDENS Csy. (*fide* Horn). Scarce, none in Nebraska collection.

* Horn, W. 1908. "Genera Insectorum" of P. Wytsman., 82:379, 394, 396.

39. C. SEXGUTTATA VIOLACEA Fab. Scarce. Eastern part of state, June 14 to August 11, 20 specimens.

40. C. PATRUELLA Dej. Scarce. Sioux County, July 18 to August 13, 4 specimens.

41. C. PATRUELLA CONSENTANEA Dej. (*fide* Schaupp). Scarce, none in Nebraska collection.

42. C. PUNCTULATA Oliv. One of the most common and widely distributed species in the state. Taken mostly in July and August, June 2 to October 30, 306 specimens.

43. C. PUNCTULATA MICANS Oliv. Not very common. Western part of state. Hitchcock, Dundy, Scotts Bluff, Thomas and Sioux counties. June 23 to August 15, 21 specimens.

44. C. CELERIPES Lec. Common in eastern part of state, May 20 to August 19, 280 specimens.

45. C. CURSITANS Lec. Scarce. Douglas, Cuming, Hitchcock and Dakota counties, June to August, 21 specimens.

46. C. PUSILLA Say. Taken only in extreme northwestern portion of state. Sioux County, June 20 to August 16, 56 specimens.

47. C. PUSILLA TERRICOLA Say. Scarce. Sioux County, July, one specimen.

48. C. PUSILLA SAYANELLA Csy. (*fide* Leng). Scarce. None in Nebraska collection.

49. C. PUSILLA CINCTIPENNIS Lec. Scotts Bluff, Dawes and Sioux counties, June 20 to August 16, 46 specimens.

50. C. PUSILLA CYANELLA Lec. Scarce. Dundy and Sioux counties, June to August 16, 2 specimens.

51. C. CIRCUMPICTA Laf. Lancaster County, June 18 to October, 89 specimens.

52. C. NEVADICA Lec. (*fide* Horn). Scarce. None in Nebraska collection.

53. C. NEVADICA KNAUSI Leng. Found only in extreme eastern and southwestern portions of state. Lancaster, Dundy and Hitchcok counties, June 11 to July 24, 166 specimens.

54. C. CUPRASCENS Lec. Eastern and southwestern portions of state. Dakota, Saunders, Knox and Dundy counties, July 12 to September, 26 specimens.

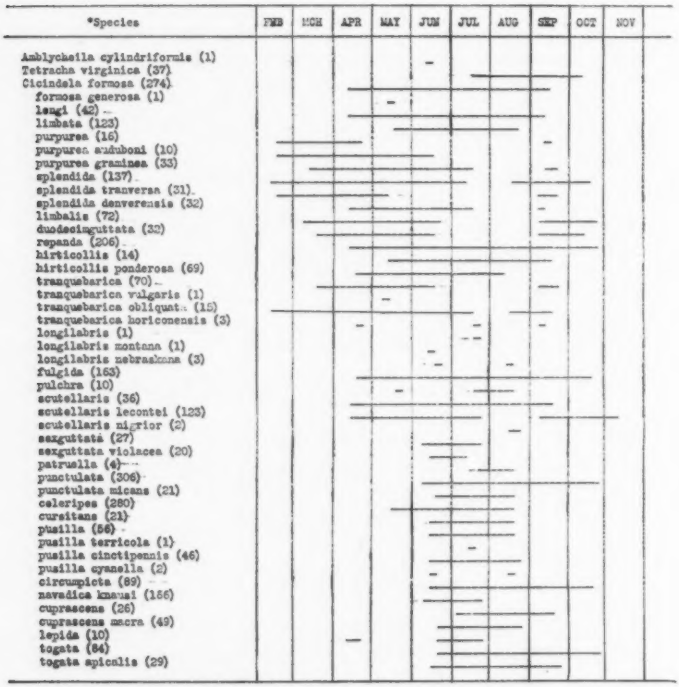
55. C. CUPRASCENS MACRA Lec. Generally distributed except in extreme northwestern part of state. June 26 to August 21, 49 specimens.

56. C. LEPIDA Dej. Rather scarce. Eastern half of state. April to July 25, 10 specimens.

57. C. TOGATA Laf. Lancaster County, June 21 to October 31, 84 specimens.

58. C. TOGATA APICALIS W. Horn. Lancaster County, April 27 to September 24, 29 specimens.

59. C. TOGATA GLOBICOLLIS Csy. (*fide* Horn). Scarce. None in Nebraska collection.



*Only those in permanent collection listed.
Numbers in parentheses following names indicate number of specimens of each species.

Discussion.

Cartwright* (1935) has shown the seasonal distribution of the South Carolina tiger beetles. It is obvious from his data that certain species range continuously through the middle of the summer. Certain others appear earlier in the year, are not

* Cartwright, O. L. 1935. The tiger beetles of South Carolina with the description of a new variety of *Tetracha virginica* (L.) (Coleoptera: Cicindelidae). Bull. Brooklyn Ent. Soc., 30:69-77.

abundant or are absent in the middle of the summer and then appear again in the fall. This is also true with the Nebraska species.

There seems to be two possible explanations of the fact that some species appear early in the spring, are absent during the hottest months of the summer and are again present in the fall. The animals, as adults, may go into aestivation during the middle of the summer or, what seems more logical, the adults winter over and appear early in the spring. The late summer and fall animals may represent a second brood. It is possible that those which range throughout the summer and appear later in the spring represent the generation which overwintered as pupae rather than adults.

Further data from other localities should shed more light on this interesting phase of seasonal distribution.

A New Generic Name (Lepidoptera, Euchromiidae).

Cisseps is here proposed for *Scepsis* Wlk., 1854, Cat. Brit. Mus., II, 285, preoccupied by *Scepsis* Wlk., 1850, Insecta Saundersiana, I, pt. 1, 71 (Diptera, Tabanidae). The type of the genus *Cisseps* is *fulvicollis* Hbn., which is the type of *Scepsis* Wlk., 1854, *nec* 1850.

Scepsis was first proposed by Walker in 1850 for a genus of Tabanid flies and was four years later again used by the same author when he erected a new genus for *Ctenucha fulvicollis*. Systematists working in the Lepidoptera have always considered the Tabanid genus as being preoccupied because the title page of the completed work, Insecta Saundersiana, bears the date 1856, but the work was issued in four parts, the first appearing in 1850, and it was in this part that *Scepsis* was first proposed. As far as I am able to determine, *Cisseps fulvicollis, C. packardii* and *C. wrightii* can neither be returned to *Ctenucha* nor placed in any of the related South American genera.

This was brought to my attention by Mr. L. L. Pechuman who is working in the Tabanidae.

J. G. Franclemont, Ithaca, New York.

Corrections for November, 1936, News.

Pages 229, 231, for Mr. J. S. Brimley, read Mr. C. S. Brimley. Page 231, first line, for California Beach read Carolina Beach.

Entomological Literature

COMPILED BY V. S. L. PATE, LAURA S. MACKEY and E. T. CRESSON, Jr.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The **figures within brackets** [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual **volume**, and in some cases the part, heft, &c. the latter **within** ( ) follows; then the pagination follows the **colon** :

All continued papers, with few exceptions, are recorded only at their first installments.

(*) Papers containing new forms or names not so stated in titles, have an * within parentheses thus (*) following the pagination of reference to paper.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

Note. Titles of papers containing new forms or new names will be indicated by an asterisk within parentheses at end of reference, (*).

Papers published in the Entomological News are not listed.

New Titles of Periodicals and Serials Referred to

14. Archivos do Instituto Biologico, Sao Paulo.

GENERAL.—Cockerell, T. D. A.—The fauna of the Sunchal (or Margas Verdes) formation, northern Argentina. [40] No. 886, 9 pp., ill. (S*). **Comstock, J. H.**—An introduction to entomology. 8th ed., revised. Ithaca, Comstock Publ. Co., 1936. xix + 1044 pp., ill. **Folsom, J. W.**—Obituary by A. S. H. [68] 84: 343-344. **Graham, A. B.**—Some thoughts on teaching entomology to adults. [12] 29: 911-913. **Hayward, K. J.**—Random notes on Argentine collecting. 2.—An unproductive winter expedition. [21] 48: 111-118. **Horn, W.**—Ueber "vergessenes," biologisches wissen. [110] 3: 238-243. **Knowlton, G. F.**—The insect fauna of Utah. [Pro. Utah Acad. Sci., Arts & Letters] 13: 249-262. **Knowlton & Smith.**—Rose insects. [Pro. Utah Acad. Sci., Arts & Letters] 13: 263-267, ill. **Kühn, A.**—Genetik und entomologie. [110] 3: 234-238. **Morofsky, W. F.**—Survey of insect fauna of some Michigan trout streams. [12] 29: 749-754. **Musser, D. R.**—Observations on the effectiveness of some moth-proofing chemical compounds. [103] 9: 116-125. **Navas, R. P. L.**—Insectos del Brasil. [Rev. Mus. Paulista] 20: 721-734, ill. (*). **Robertson, C.**—Obituary by H. B. Parks. [BIOS. Okla. City Univ.] 7:

85-96. **Semenov-Tian-Shansky, A. P.**—Notice by M. Burr. [21] 48: 107-109, ill. **Sorenson, C. J.**—Contribution to a symposium on the biology of Utah. [Pro. Utah Acad. Sci. Arts & Letters] 13: 219-223. **Swan, D. C.**—Berlese's Fluid: remarks on its preparation and use as a mounting medium. [22] 27: 389-391. **Tanner, V. M.**—List of the insect types in the entomological collections of the Brigham Young University, Provo, Utah. [Pro. Utah Acad. Sci. Arts & Letters] 13: 147-152.

ANATOMY, PHYSIOLOGY, ETC.—de Beaumont, J. —Hymenopteres gynandromorphes. [Bull. Soc. Vaudoise Sci. Nat., Lausanne] 59: 85-90, ill. **Brandt, H.**—Ueber die aenderung des geschlechtsverhältnisses bei insekten und ihre ursachen. [110] 3: 218-221. **Crampton, G. C.**—Suggestions for a new interpretation of the postabdomen in male Cyclorhaphous Diptera. [19] 31: 141-149, ill. **Davis & Harris.**—The biology of Pseudosinella violenta, with some effects of temperature and humidity on its life stages. [Iowa St. Coll. J. Sci.] 10: 421-428, ill. **Deckers & Andre.** —Studies on temperature and moisture as factors influencing winter mortality in adult chinch bugs. [Iowa St. Coll. J. Sci.] 10: 403-420. **Fidler, J. H.**—On the first instar larvae of some species of Otiorrhynchus found on strawberries, with notes on their biology. [22] 27: 369-376, ill. **Flemion & Hartzell.**—Effect of low temperature in shortening hibernation period of insects in the egg stage. [12] 29: 806. **Foxon, G. E. H.**—Observations on the locomotion of some Arthropods and Annelids. [75] 18: 403-419, ill. **Frey, W.**—Untersuchungen über die Entstehung der Strukturfarben der Chrysididen nebst Beiträgen zur Kenntnis der Hymenopterencuticula. [46] 31: 442-489, ill. **Galliard, H.**—Recherches sur les Reduvides nematophages Rhodnius et Triatoma. [54] 14: 1-34. **Harland, S. C.**—Genetic behaviour of a mutant in a Trinidad cotton stainer (Dysdercus urichi). [Tropical Agrculture] 13: 256. **Hilton, W. A.** —Nervous system and sense organs. LVII. Protura. Nervous system and sense organs. LVIII Insects, General. Nervous system and sense organs. LIX. Insecta Thysanura.. [13] 28: 11-12; 29-38; 47-53, ill. **Hodge, C.** —The anatomy and histology of the alimentary tract of the grasshopper, Melanoplus differentialis. [J. Morph.] 59:423-440, ill. **Janes & Hager.**—Studies on the incubation of chinch bug eggs. [Iowa St. Coll. J. Sci.] 10: 395-402. **Key, K. H.**

L.—Experimental studies on locomotor activity in Locusta migratoria migratorioides. [22] 27: 399-422, ill. **Knipling, E. F.**—A comparative study of the first-instar larvae of the genus Sarcophaga (Calliphor.), with notes on the biology. [J. Parasitol.] 22: 417-454, ill. **Koneff, A. A.**—An iron-hematoxylin-anilin-blue staining method for routine laboratory use. [Anat. Rec.] 66: 173-176, ill. **Koonz, C. H.**—Some unusual cytological phenomena in the spermatogenesis of a haploid parthenogenetic Hymenopteran, Aenoplex smithii. [92] 71: 375-385, ill. **Lameere, A.**—Precis de zoologie. IV. Myriapodes, characteres fondamentaux des insectes, les insectes inferieurs, chap. XV, XVI. Les paurometaboloques, pp. 263-468. Les holometaboliques, pp. 1-160, ill. [Recueil. Inst. Zool. Torley-Rousseau Univ. Brus.] VI. fas. 1. **Lassmann, G. W. P.**—The early embroyological development of Melophagus ovinus with special reference to the development of the germ cells. [7] 29: 397-413, ill. **Maurice, A.**—La Lucilia sericata en therapeutique. [54] 14: 35-47, ill. **Mer, G. G.**—Experimental study on the development of the ovary in Anopheles elutus (Dipt. Culicidae). [22] 27: 351-359. **Nieschultz, O.**—Die Entwicklungstadiens von Tabanus rubidus und T. striatus (Dipt.). [52] 5: 230-255, ill. **Querci, O.**—Effects of alimentation on the development of some Pierinae (Lepid.). [21] 48: 110-111. **Roy, D. N.**—On the role of ovulation in Aedes aegypti. (Dipt. Culicid.). [22] 27: 423-429. **Scott, A. C.**—Haploidy and aberrant spermatogenesis in a Coleopteran, Micromalthus debilis. [J. Morph.] 59: 485-516, ill. **Snodgrass, R. E.**—Morphology of the insect abdomen. Part 111. The male genitalia. [Smiths. Misc. Coll.). 95: 96 pp., ill. **Squire, F. A.**—Observations on the pupal respiration of some insects of economic importance. [22] 27: 381-384, ill. **Tauber, O. E.**—Mitosis of circulating cells in the hemolymph of the roach, Blatta orientalis. [Iowa St. Coll. J. Sci.] 10: 431-439, ill. **Thorpe, W. H.**—On a new type of respiratory interrelation between an insect (Chalcid) parasite and its host (Coccidae). [116] 28: 517-540, ill. **de la Torre-Bueno, (R. T.) & Ambrose.**—Effects of the protective vapors of the Coreid bug Thasus gigas on a tarantula (Eurypelma sp.). [19] 31: 184. **Trager, W.**—The utilization of solutes by mosquito larvae. [92] 71: 343-352, ill. **Wagner, J.**—Ueber den Bau des Hinterdarms bei Flohlarven und seine Veränderungen wahrend der Metamorphose beim Menschenfloh (Pulex irritans). [89] Abt. Anat., 61: 343-390, ill.

West, A. S.—Winter mortality of larvae of the European pine shoot moth, Rhyacionia buoliana in Connecticut. [7] 29: 438-448.

ARACHNIDA AND MYRIOPODA. — **Braendegaard, J.**—Revisal of spiders from Ellesmereland collected by the second arctic expedition of the "Fram". [Norsk Ent. Tidssk.] 4: 128-130. **Delpy, L.**—Sur la teratologie du sous-genre Hyalomma. [54] 14: 48-54, ill. **Frick, G.**—Das Zeichnungsmuster der Ixodiden. Versuch der Analyse einer Tierzeichnung. [46] 31: 411-430, ill. **Gertsch & Davis.**—New spiders from Texas. [40] No. 881, 21 pp., ill. **Gertsch & Wallace.**—Notes on new or rare American Mygalomorph spiders. [40] No. 884, 25 pp., ill. **Lundblad, O.**—Weitere neue Wassermilben aus Santa Catharina in Sudbrasilien. [Zool. Anz.] 116: 14-24. **Mello-Leitao.** — Alguns novos opelioes do Estado de S. Paulo e do Dist. Federal. [Arch. Mus. Nac. R. d. Janeiro] 36: 9-37, ill. (*). **de Mello-Leitao, C.**—Essai monographique de la famille Acanthoctenidae. [15] 8: 179-203, ill. (*). **Viets, K.**—Spinnentiere oder Arachnoidea. VII. Wassermilber oder Hydracarina (Hydrachnellae und Halacaridae. [Tierwelt Deutschlands] Pts. 31 & 32, 288 pp., ill.

THE SMALLER ORDERS OF INSECTS.—Anon.—Insecta, Thysanura. [13] 28: 47-53, ill. **Bailey, S. F.**—Our knowledge of California Thysanoptera previous to 1900. [55] 12: 97-103. **Davis, Reid & Harris.**—The biology of Pseudosinella violenta with some effects of temperature and humidity on its life stages. (Entomobryidae). [Iowa St. Coll. Jour. Sci.] 10: 421-428, ill. **Goetsch, W.**—Beitrage zur Biologie des Termitenstaates. [46] 31: 490-560, ill. **Guimaraes, L. R.**—Contribuções para o conhecimento das Mallophagas das aves do Brasil. IV. Dois novos generos e uma nova especie de fam. Philopteridae. [Rev. Mus. Paulista] 20: 221-228, ill. **Hilton, W. A.**—Campodea from the United States. [13] 28: 5-10, ill. (*). **Kennedy, C. H.**—The habits and early stages of the dragonfly Gomphaeschna furcillata. [Pro. Ind. Acad. Sci.] 45: 315-322, ill. **Light, S. F.**—A tropical termite in California. [55] 12: 125-126. **Moulton, D.**—New Thysanoptera belonging to the genus Thrips. [55] 12: 104-110. **Owen, W. B.**—An infestation by the oriental rat flea, Xenopsylla Cheopis, in Minnesota. [J. Parasitol.] 22: 512-513. **Rau, P.**—Termites and the Drought. [19] 31: 153. **Upholt, W. M.**—A n. sp. of mayfly

from California. [55] 12: 120-122, ill. **Werneck, F. L.**—Contribuicao ao conheciemento dos Mallophagos encontrados nos mammiferos sul-americanos. [111] 31: 391-590, ill. (*).

ORTHOPTERA.—Cockerell, T. D. A.—(See under General). **Hebard, M.**—Studies in Orthoptera which occur in North America north of the Mexican boundary. VI. A revision of the genus Arethaea (Tettigoniidae). [1] 62: 231-256, ill. **Miranda Ribeiro, P.**—Dous novos Blattidas brasileiros. [Rev. Mus. Paulista] 20: 215-219, ill. **Sorenson & Knowlton.**—Grasshopper survey in Utah, 1935. [Pro. Utah Acad. Sci., Arts & Letters] 13: 233-236, ill.

HEMIPTERA.—Ball, E. D.—Some new leafhoppers related to Thamnotettix. [91] 26: 430-434, ill. **Beck, D. E.**—Report on collection of water striders in Brigham Young University entomological collection. [Pro. Utah Acad. Sci., Arts & Letters] 13: 203-206. **Deay & Gould.**—Hemiptera unrecorded from Indiana. [Pro. Ind. Acad. Sci.] 45: 305-309. **Drake & Harris.**—Notes on American water-striders. [95] 49: 105-108. (S*). **Drake & Poor.**—The genera and genotypes of Tingitoidea of the western hemisphere. [Iowa St. Coll. J. Sci.] 10: 381-390. **Harris & Johnston.**—A n. gen. and n. sp. of Podopidae and a new Coenus (Scuteller.). [Iowa St. Coll. J. Sci.] 10: 377-78, ill. **Hungerford, H. B.**—A new Potamobates from Peru, S. Am. (Gerridae). [19] 31: 178-180. **Hyslop, J. A.**—The periodical cicada. [12] 29: 671-676. **Knowlton & Allen.**—Some intermountain leafhoppers. [Pro. Utah Acad. Sci., Arts & Letters] 13: 269-276, ill. **La Hue, D. W.**—An annotated list of the Bythoscopinae of Indiana (Cicadell.). [Pro. Ind. Acad. Sci.] 45: 310-314. **Leonard, M. D.**—Additions to the New York State list of Aphids with notes on other New York species. [6] 44: 177-185. **Oman, P. W.**—Two new leafhoppers from tropical America. [55] 12: 116-119, ill. **Ossiannilsson, F.**—A new N. Am. sp. of Typhlocyba (Cicadell.), Typhlocyba dorsti. [28] 57: 10-11, ill. **Sorenson & Anthon.**—Preliminary studies of Acrosternum hilaris in Utah orchards. [Pro. Utah Acad. Sci., Arts & Letters] 13: 229-232. **Usinger, R. L.**—Studies in the American Aradidae with descr. of n. sp. [7] 29: 490-516, ill.

LEPIDOPTERA.—Clark, A. H.—The swallowtail butterflies. [Rep. Smiths. Inst.] 1935: 383-408, ill. **Field, W.**

D.—New N. Amer. Rhopalocera. [13] 28: 17-26. **Forbes, W. T. M.**—The Cirphis pseudargyria complex (Noctuidae). [6] 44: 239-247, ill. (*). **Hall, F. T.**—The occurrence of unusual Rhopalocera in Indiana. [Proc. Ind. Acad. Sci.] 45: 273-274. **Klots, A. B.**—The interrelationships of the species of the genus Lycaena (Lycaen.). [19] 31: 154-171, ill. **Richards, A. G.**—A revision of the Noctuid genus Bulia (= Cirrhobolina). [7] 29: 431-437, ill. (*). **Sheldon, W. G.**—Tobago and its butterflies. [9] 69: 240.

DIPTERA.—Bromley, S. W.—The genus Diogmites in the United States of America with descr. of n. spp. (Asilidae). [6] 44: 225-237 (*). **Bruce & Knipling.**—Seasonal appearance and relative abundance of flies attracted to baited traps. [Iowa St. Coll. J. Sci.] 10: 361-365. **Curran, C. H.**—New Neotropical Syrphidae. [40] No. 882, 17 pp. **Edwards, F. W.**—Inverted male hypopygia in Eriopterine crane-flies. [9] 69: 243. **Enderlein, G.**—Notizen zur Klassifikation der Blepharoceriden. [Mit. Deutsch. Ent. Ges.] 7: 42-43, (*). **Hardy, D. E.**—A new Bibionidae from Utah. [Pro. Utah Acad. Sci., Arts & Letters] 13: 195. **Horsfall, W. R.**—Occurrence and sequence of mosquitoes in southeastern Arkansas in 1935. [12] 29: 676-679. **Huckett, H. C.**—A revision of connectant forms between Coenosian and Limnophorine genera occurring in N. A. (Muscidae). [6] 44: 187-223, ill. (*). **James, M. T.**—The genus Odontomyia in America north of Mexico (Stratiomyiidae). [7] 29: 517-550, ill. (*). **Knipling, E. F.**—A comparative study of the first instar larvae of the genus Sarcophaga, with notes on the biology. [Jour. Parasit.] 22: 417-454, ill. **Knowlton, G. F.**—Some Utah flesh flies.. Utah Tachinidae-Notes. Pipunculidae. [Pro. Utah Acad. Sci., Arts & Letters] 13: 237-239; 241-244; 245-247. **Komp & Osorno.**—The male and larva of Anopheles (Kerteszia) boliviensis (Culicidae). [7] 29: 415-419, ill. **Krober, O.**—Drei neue Poeciloderas-Arten aus Paraguay (Taban.). [109] 3: 221-223. **Lane, J. I.**—Notas sobre mosquitos de S. Paulo. [Rev. Mus. Paulista] 20: 429-435. Notas sobre culicideos de Matto Grosso. [Rev. Mus. Paulista] 20: 173-206, ill. **Maughan, L., & Johnson, D. E.**—Notes on Utah Bombyliidae. [Pro. Utah Acad. Sci., Arts & Letters] 13: 197-201. **Münchberg, P.**—Zur kenntnis des larvenparasitismus der Thyasinae (Hydracarina), zugleich ein beitrag über Schmarotzer der Limnobiinae. [Internat. Rev.] 33: 313-

326, ill. **Rozeboom, L. E.**—The life cycle of laboratory-bred Anopheles albimanus (Culicidae). [7] 29: 480-489. **Schwardt, H. H.**—Horseflies of Arkansas. [Univ. Ark. Agr. Exp. Sta.] Bull. No. 332, 66 pp., ill. **Twinn, C. R.**—The blackflies of western Canada (Simul.), Pt. I. [Canad. J. Res., D, Zool.] 14: 97-130, ill. (*). **Weyer, F.**—Kreuzungsversuche bei stechmücken. (Culex pipiens und C. fatigans). [110] 3: 202-208, ill. **Wilcox, J.**—New Ommatius with a key to the species (Asil.). [19] 31: 172-177, ill. **Wilcox & Martin.**—The genus Nannocyrtopogon (Asilidae). [7] 29: 449-459, ill. (*).

COLEOPTERA.—Blaisdell, F. E.—Note regarding Eschatomoxys wagneri (Tenebr.). [55] 12: 120. **Blake, D. H.**—A redisposition of Monoxia puncticollis and allied species. [91] 26: 423-430, ill. **Bottimer, L. J.**—Bruchus brachialis in Georgia. [12] 29: 807. **Buchanan, L. L.**—The Pacificus group of Cossonus (Curcul.). [55] 12: 111-116, (*). **Canova, M. F.**—An annotated list of the Lepturini of Oregon (Ceramby.). [55] 12: 126-132. **Cazier, M. A.**—Notes on Cicindela plutonica with descr. of a n. subsp. [55] 12: 123-124. **Chagnon, G.**—Contribution a l'etude des Coleopteres de la province de Quebec. [Le Nat. Canadien] 63: 201-210, ill. **Cockerell, T. D. A.**—(See under General). **Csiki, E.**—Coleopterorum Catalogus. Pars. 149. Curculionidae: Rhynchophorinae, Cossoninae. 212 pp. **Darlington, P. J.**—An interesting Pterostichus and a new Colpodes from Arizona (Carab.). [19] 31: 150-153, ill. **van Emden, F.**—Eine interessante, zwischen Carabidae und Paussidae vermittelnde käferlarve. [110] 3: 250-256, ill. **Fidler, J. H.**—(See under Physiology). **Knowlton & Thatcher.**—Notes on wood-boring insects. [Pro. Utah Acad. Sci. Arts & Letters] 13: 277-281, ill. **Krumbiegel, I.**—Untersuchungen ueber gleichsinnige geographische variation. [89] Abt. Syst. 68: 481-516, ill. **Linsley, E. G.**—Preliminary studies in the North American Phoracanthini and Sphaerionini (Cerambyc.). [7] 29: 461-479, ill. (*). A note on the occurrence of Hesperorhipis albofasciatus (Bupres.). [55] 12: 110. Hibernation in the Cerambycidae. [55] 12: 119. **Lona, C.**—Coleopterorum Catalogus. Pars 148. Curculionidae: Otiorrhynchinae I. 226 pp. **Luederwaldt, H.**—Notas complementares "As especies brasileiras do genero Pinotus." [Rev. Mus. Paulista] 20: 207-216. **Marshall, G. A. K.**—New injurious Curculionidae from S. Am. [22] 27: 497-501,

ill. **Maulik, S.**—A new Brazilian Hispine beetle. [75] 18: 392-397, ill. **Pic, M.**—Descriptions de Coleopteres. [25] 41: 213-216 (S*). **Prell, H.**—Beiträge zur kenntnis der Dynastinen. [2] 32: 145-152. **Ray, E.**—The neotropical Mordellidae of the Deutsches Entomologisches Institut, with descriptions of n. sp. [109] 3: 215-221, ill. **Saylor, L. W.**—New Californian and Texas Scarabs. [13] 28:1-4, ill. **Schenkling & Marshall.**—Coleopterorum Catalogus. Pars 150. Curculionidae: Prionomerinae, Aterpinae, Amalactinae, Haplonychinae, Omophorinae. 1-11; 1-9; 1-3; 1-8; 1-2. **Tanner, V. M.**—Description of two Melyrids from Utah (Melyridae). [Pro. Utah Acad. Sci., Arts & Letters] 13: 153-154, ill. **Thery, A.**—Notes sur le genre Capnodis. (Buprest.). [25] 41: 219-223. **Whelan, D. B.**—Coleoptera of an original prairie area in eastern Nebraska. [103] 9: 111-115.

HYMENOPTERA.—**Bugbee, R. E.**—Phylogeny of some Eurytomid genera (Chalcid.). [70] 16: 169-223, ill. **Cockerell, T. D. A.**—Bees from British Guiana. [6] 44: 249-252 (*). Bees from northern California. [55] 12: 133-164 (*). **Compere, H.**—A n. sp. of Habrolepis parasitic in Chrysomphalus aurantii. [22] 27: 493-496, ill. **Cushman, R. A.**—The Ichneumon-flies of the genus Brachycyrtus. [50] 84: 17-24, ill. (*). **Ferriere, C.**—Un nouveau parasite de thrips de la Suisse (Chalcid.). [41] 16: 637-639, ill. **Frey, W.**—(See under Physiology). **Gussakovskij, V. V.**—Eine neue Art der Gattung Cephalonomia (Bethyl.), parasit von Silvanus surinamensis. [72] 25: 229-231, ill. **Miles, H. W.**—On the biology of Emphytus cinctus and Blennocampa waldheimi (Tenthr.). [22] 27: 467-473, ill. **Oldroyd & Ribbands.**—On the validity of trichiation as a systematic character in Trichogramma (Chalcididae). [107] B 5: 148-152, ill. **Phillips, W. J.**—A second revision of the chalcid flies of the genus Harmoleto (Isotoma) of America north of Mexico. [U. S. Dept. Agric.] Tech. Bull. 518: 25 pp., ill. (*). **Richards, O. W.**—Further notes on the nomenclature of British Aculeate Hymenoptera. [107] B, 5: 169-173. Notes on American species of Trypoxylon (Sphec.). [75] 18: 457-463 (S*). **Roman, A.**—The Linnean Ichneumon types of the Stockholm Museum. [28] 57: 1-5. **Smith, M. R.**—Ants of the genus Ponera in America north of Mexico. [7] 29: 420-430. **Smulyan, M. T.**—A revision of the chalcid flies of the genus Perilampus occurring in

America N. of Mexico. [50] 83: 369-412. **Vest, E. T.**—Observations on the nesting habits of Odynerus dorsalis (Vespidae). [Pro. Utah Acad. Sci., Arts & Letters] 13: 207-209. **Wheeler, W. M.**—Ants from Hispaniola & Mona Island. [Bull. Mus. Comp. Zool.] 80: 195-211.

SPECIAL NOTICES. — International Commission on Zoological Nomenclature.—Opinions 124 to 133. [Smithson. Misc'l. Coll.] 73, No. 8, 44 pp. **Lane, F.**—Algunas notas sobre o genero Phathmoscetis e descripcão de uma especie nova. [Rev. Mus. Paulista] 20: 765-775, ill. **Thienmann, A.**—Alpine Chironomiden (Ergebnisse von untersuchungen in der gegend von Garmisch-Partenkircheis, Obertagern). [Arch. fur Hydrobiol.] 30: 11-262, ill. **Wu, C. F.**—The stoneflies of China. [Peking Nat. Hist. Bull.] 11: 49-82, cont.

Special Notice. Entomologists do not usually look in the Bulletin of the New York Public Library for articles in their field. We therefore call attention to the issues of the Bulletin for September and October, 1936, Nos. 9 and 10 respectively, of Vol. 40. They contain two installments, pages 739-752, 827-828, of "The more important insect enemies of books," by Harry B. Weiss and Ralph H. Carruthers. After a brief historical introduction, the enemies are briefly described under the headings *Troctes divinatoria et al., Lepisma saccharina et al.,* Cockroaches, *Sitodrepa panicea, Ptinus fur, Dermestes lardarius et al., Catorama mexicana,* Other beetles, Brown Housemoth (*Borkhausenia pseudospretella*) Termites, Other miscellaneous insects and Control of book insects in the tropics. There are two half-tone plates of 5 species of Dermestidae and 9 species of other insects. The October number also contains "Insect pests of books. An annotated bibliography up to 1935. Part I," by Ralph H. Carruthers and Harry B. Weiss, pp. 829-841. One hundred and five titles are entered under the headings Bibliography, Ancient and Classical periods, To the end of the 17th century and 18th century. Under each heading the entries stand under their authors' names, arranged alphabetically. The annotations are often extensive. We are informed that this will be completed in the December number, after which the library will print separates at a slight cost.

P. P. CALVERT.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Wanted—Collectors desiring living pupae with cocoon attached to natural food plant of Michigan, Samia, Columbia or hybrid with S. Cecropia, write W. S. McAlpine, 575 Townsend St., Birmingham, Mich.

Wanted—North American Chrysididae for exchange or determination, with privilege of retaining duplicates. W. G. Bodenstein, Department of Entomology, Cornell University, Ithaca, New York.

Wanted—Chloropidae (Oscinidae) of the world. Study, determination or exchange. C. W. Sabrosky, Entomology Dept., Michigan State College, East Lansing, Mich.

Wanted—Heliconia from various parts of Mexico, Central and South America, especially Bolivia. Buy or exchange. F. E. Church, 15 West 67th St., New York, N. Y.

(Continued on third page of cover).

SUBSCRIPTION BLANK

Enclosed find payment for my subscription to ENTOMOLOGICAL NEWS for one year, beginning with issue for.....

Name .....

Address .....

Post Office .....

The subscription price per year of ten (10) numbers:

United States, Central and South America, $3.00
Canada, - - - - - - - - 3.15
Foreign, - - - - - - - - 3.25

Payments are acceptable in United States currency and Postal Money Order, by Check on Domestic (United States) bank, Foreign draft on New York, and by International Postal Order.

Address ENTOMOLOGICAL NEWS,
1900 RACE STREET, PHILADELPHIA, PA., U. S. A.

RECENT LITERATURE

FOR SALE BY

THE AMERICAN ENTOMOLOGICAL SOCIETY

1900 RACE STREET, PHILADELPHIA, PA.

COLEOPTERA

1018.—**Blaisdell** (F. E.).—Two new species of Euschides (Tenebrionidae). (Trans., **62**, 223-230, 1936) ..... .20

DIPTERA

1020.—**Cresson** (E. T., Jr.).—Descriptions and notes on genera and species of the Dipterous family Ephydridae. II. (Trans., **62**, 257-270, 1936) ..... .30

HYMENOPTERA.

1016.—**Mitchell** (T. B.)—A revision of the genus Megachile in the Nearctic region. IV. Taxonomy of subgenera Xanthosarus, Phaenosarus, Megachiloides and Derotropis (Megachilidae.) (Trans., **62**, 117-166, 4 pls., 1936) 1.00

1013.—**Pate** (V. S. L.).—Studies in the nyssonine wasps. I. Species of Psammaïetes, a n. subg. of Hoplisoides (Sphecidae). (Trans., **62**, 49-56, 1936) ..... .20

ODONATA.

1015.—**Needham and Fisher.**—The nymphs of North American Libelluline dragonflies. (Trans., **62**, 107-116, 2 pls., 1935) ..... .20

ORTHOPTERA

1017.—**Hebard** (M.).—New genera and species of Melanopli found within the U. S. and Canada (Acrididae). Pts. 7-9. (Trans., **62**, 167-222, 6 pls., 1936) 1.25

1019.—**Hebard** (M.).—Studies in Orthoptera which occur in N. Amer. north of the Mexican boundary. VI. A revision of the genus Arethaea (Tettigoniidae). (Trans., **62**, 231-256, 2 pls., 1936) ..... .40

Write your name and address in the space below. If that given is not correct, please advise us.

Herewith find remittance for $_____, for which please send me the items checked above.

INDEX TO VOLUME XLVII.

(* indicates new genera, species, names, etc.)

ABBOTT, C. E. On the olfactory powers of Megarhyssa lunator 263
BEQUAERT, J. Two new color forms of Polistes major from California and Arizona 7
BISHOP, S. C. and CROSBY, C. R. Notes on some spiders of the family Pisauridae 238
BLAISDELL, F. E. Facts concerning the rearing of Tenebrionidae 39
BLATCHLEY, W. S. A change of name in Staphylinidae.. 255
BRADLEY, J. C. At the International Congresses of Entomology and Zoology, of 1935..... 29, 57
BRITTON, W. E. Clusters of Atherix variegata, mistaken for rust patches 55
BYERS, C. F. The immature form of Brachymesia gravida, with notes on the taxonomy of the group..... 35, 60
CALVERT, P. P. Neotropical Aeshnas wanted..... 213
Editorial: Entomology of the Convocation Week Meetings, December 30, 1935, to January 4, 1936..... 76
Obituary: Anton Handlirsch 168
Obituary notice: Justus Watson Folsom 256
Obituary: Albert P. Morse 228
Obituary: Charles Robertson 228
Review: Insect enemies of shade-trees 134
Review: The Pioneer Century of American Entomology 196
Review: Zurr Kenntniss der Odonatenparasiten..... 197
Review: A monograph of the British Neuroptera..... 226
Review: General catalogue of the Hemiptera..... 255
Review: The more important insect enemies of books.. 284
COCKERELL, T. D. A. The future of entomology..... 1
Review: The genitalia of the Tineina..... 224
COLE, A. C., JR. Description of seven new western ants.. 118
COLLINS, B. J. A new species of Anomiopsyllus from Montana 128

CRESSON, E. T., JR. Review: Dipterologi and Hymenopterorum Catalogus 55
Review: Ward's Entomological Bulletin 75
Review: Contribution to a bibliography of the described immature stages of North American Coleoptera..... 112
Review: Ancient Artizans 227
CRESSON, (see also Pate, V. S. L., Mackey, Laura S., and Cresson, E. T., Jr.)
CRESSON, (see also Schmieder, R. G. & Cresson, E. T., Jr.)
CROSS, F. C. New organization for amateur entomologists 153
DAGGY, R. H. New butterfly record for United States... 52
DOUDOROFF, (see Ferris, G. F. & Doudoroff, M.)
FATTIG, P. W. The Coleoptera or beetles of Georgia, II.. 15
An unusual mating of velvet ants 51
The coleoptera or beetles of Georgia, III 233
FELT, E. P. Two new cockle burr midges..... 231
FERRIS, G. F. & DOUDOROFF, M. Taxonomic problems in Lepidoptera 124
FIELD, W. D. Three new butterfly races..,..... 121
FRANCLEMONT, J. G. A new generic name..... 275
FRISON, T. H. Review: Bumblebees and their ways..... 83
FROST, S. W. A summary of insects attracted to liquid baits 64, 89
HEBARD, M. Notes on North American Orthoptera of the Arctic-Alpine Zone 13
Review: A monographic revision of the genus Ceuthophilus 165
HICKS, C. H. Tracheloides hicksi hunting ants..... 4
HILL, R. E. A new bee of the genus Coelioxys from Nebraska 205
HINTON, H. E. Notes on some American Colydiidae.... 185
HULL, F. M. Change of name 227
HUNGERFORD, H. B. The Mantispidae of the Douglas Lake, Michigan Region, with some biological observations 69, 85
ISELY, F. B. Flight-stridulation in American Acridians.. 199

JOHNSON, (see de Long, D. M. & Johnson, D. M.)
KNIGHT, H. H. Review: An abridged catalogue of certain Scutelleroidea of China, Chosen, Indo-China and Taiwan 167
KROMBEIN, K. V. Biological notes on some solitary wasps 93
KNOWLTON, G. F. & SMITH, C. F. Notes on intermountain aphids 210
KNULL, J. N. Five new Southwestern Coleoptera.... 73, 105
DE LONG, D. M. & JOHNSON, D. M. Six new species of Typhlocyba from the United States..... 101
MCCLURE, H. E. Psocid habits 113, 143
MACKEY, (see Pate, V. S. L., Mackey, Laura S., and Cresson, E. T., Jr.)
MEINERS, E. P. Notes on Papilio asterius and a record of var. americus 269
MESERVE, F. G. The Silphidae of Nebraska..... 132
The Cicindelidae of Nebraska 270
MICHENER, C. D. Some California bees, Townsendiella and Hesperapis 181
MILLER, F. W. Nephrocyte cells and their function in the Aphididae 169
NASH, R .W. Thysania zenobia in Maine 268
PATE, V. S. L., MACKEY, LAURA S. AND CRESSON, E. T., JR. Entomological Literature. 21, 45, 78, 108, 135, 159, 190, 216, 249, 276.
Rhectognathus, a new group in the Lindenius complex.. 147
PHILIP, C. B. An interesting new horsefly from North Carolina 229
PIERCE, W. D. The position of the Strepsiptera in the classification of insects 257
PRITCHARD, A. E. Notes on Somatochlora ozarkensis.... 99
RIEGEL, G. T. An insect with seven tarsi..... 158
RODECK, H. G. Colorado lepidoptera records..... 189
ROSS, H. H. A new pecan sawfly, Megaxyela langstoni.. 131
SABROSKY, C. W. Some synonymy in the Chloropid genera Hippelates and Diplotoxa 245
SANDHOUSE, G. A. A new species of Tracheloides..... 2

SATTERTHWAIT, A. F. Description of the male of Calendra dietrichi 38
SCHMIEDER, R. G. Review: Die Blatt-Minen Mittel-und Nord-Europas 20
SCHMIEDER, R. G. & CRESSON, E. T., JR. Review: Das werden einer grossen encyclopaedie 53
SLIFER, E. H. The Scopoparia of Melanoplus differentialis 174
SMITH, (see Knowlton, G. F. & Smith, C. F.)
SPIETH, H. T. Review: The biology of mayflies with a systematic account of North American species..... 140
STEHR, W. C. Some notes and records of Minnesota orthoptera 154
STILES, C. W. Notice of possible suspension of Rules of Nomenclature in certain cases 214
STROHECKER, H. F. A new Timema from California.... 267
SWAIN, R. B. Notes on the oviposition and life-history of the leafhopper Oncometopia undata..... 264
WESSON, L. G., JR. Contributions toward the biology of Strumigenys pergandei: A new food relationship among ants 171
WILCOX, J. A new robber fly, with a key to the species of Callinicus and Chrysoceria 208

GENERAL SUBJECTS

Amateur entomologists, New organization for 153
Classification, Position of families 257
Convocation Week meetings.. 76
Cornell, Depart. of Entomol. Head 248
Corrections 275
Entomological Literature, 21, 45 78, 108, 135, 159, 190, 216, 249, 276.
Food of Ants 171
Hosts, Insects 42, 93
Hosts, Plants 207, 211, 231
Insects attracted to baits..... 89
International Congresses of Ent. and Zoology, of 1935 29, 57
Malarial Mosquitoes 38
Nomenclature, Notice of possible suspension of rules.... 214
Olfactory powers of Megarhyssa 263
Oviposition and life-history of Oncometopia 264
Plants attacked by insects ... 94
Rockefeller Foundation, International Health Division .. 227
Rocky Mountain Conference of Entomologists 27
Stylops, Discontinuation of... 44

OBITUARY NOTICES

Benjamin, F. H 112
Caudell, A. N. 112
Folsom, J. W. 256
Handlirsch, A. 168
Morse, A. P. 228
Robertson, C. 228

PERSONALS

Johannsen, O. A. 248
Morgan, T. H. 255
Shannon, R. C. 248
Walsh, B. D. 248
Wheeler, W. M. 225

REVIEWS

Frost: Ancient Artizans 227
Hedicke: Hymenopterorum Catalogus 55
Hering: Die Blatt-Minen Mittel-und Nord-Europas 20
Herrick: Insect enemies of shade-trees 134
Hoffmann: An abridged catalogue of certain Scutelleroidea of China, Chosen, Indo-China, and Taiwan... 167
Hubbell: A monographic revision of the genus Ceuthophilus 165
Junk: Das werden einer grossen encyclopaedie 53
Dipterologi 55
Killington: A monograph of the British Neuroptera..... 226
Metcalf: General catalogue of the Hemiptera 255
Munchberg: Zur Kenntniss der Odonatenparasiten 197
Needham, Traver & Yin-Chi Hsu: The biology of mayflies with a systematic account of North American species 140
Pierce & Metcalfe: The genitalia of the Tineina..... 224
Plath: Bumblebees and their ways 83
Wade: Contribution to a bibliography of the described immature stages of North American Coleoptera 112
Ward's Entomological Bulletin 75

Weiss: The Pioneer Century of American Entomology... 196
Weiss & Carruthers: The more important insect enemies of books 284

GEOGRAPHICAL DISTRIBUTION

Alabama: Dipt. 232
Arizona: Hym. 7, 10, 12, 120, 121
California: Dipt. 209; Hym. 7, 12, 118, 182, 183, 184; Orth. 267
Colorado: Hom. 104; Hym. 2; Lepid. 189.
Colorado lepidoptera records.. 189
Connecticut: Arach. 242; Dipt. 55
Florida: Arach. 242; Col. 38; Odon. 36.
Georgia, Beetles of 238
Coleoptera of 15
Georgia: Hym. 51
Idaho: Hom. 103; Hym. 119, 121; Lep. 122.
Idaho, Notes on intermountain aphids 210
Illinois: Col. 158
Maine: Lepid. 268
Michigan: Neur. 69
Minnesota: Lep. 52
Minnesota: Some notes and records of Orthoptera 154
Mississippi: Arach. 243; Hym. 131
Missouri: Hom. 264; Lepid. 269
Montana: Lep. 123; Neur. 128
Nebraska: Hym. 120, 205
Nebraska Cicindelidae 270
Nebraska, Silphidae of 132
New Jersey: Arach. 242
New York: Arach. 242; Hym. 93
North Carolina: Arach. 243; Dipt. 229.
Oklahoma: Odon. 99
Pennsylvania: Hom. 102
Texas: Arach. 242; Col. 73, 106, 108; Dipt. 231.
Utah, Notes on intermountain aphids 210
Washington: Lep. 122
Wisconsin: Hom. 103
Bahamas Islands: Hym. 11
Central America: Hym. 10
Mexico: Hym. 10
South America: Col. 188; Hym. 11, 13.
West Indies: Col. 187; Hym. 10
West Indies, Homoptera of.. 88

COLEOPTERA

acaciae, Chrysobothris* 105
Acmaeodera (see *uvaldensis*)
Bait, Attracted to 68
Buprestidae 73, 105
Calendra (see *dietrichi*)
Cerambycidae 105
Chrysobothris (see *acaciae*)
Cicindelidae 270
Colydiidae 185
Conotrachelus (see *nenuphar*)
cubanus, Lapethus* 186
Curculionidae 38
dietrichi, Calendra 38
Euphoria (see *inda*)
fasciatus, Glischrochilus 68
futilis, Phyllophaga 158
Glischrochilus (see *fasciatus*)
Gypona (see *striata*)
imitans, Leiopus* 107
inda, Euphoria 68
kessleri, Philonthus* 256
Lachnosternae at bait 68
Lapethus 185
(see also *cubanus, lateralis*)
lateralis, Lapethus* 187
Leiopus (see *imitans*)
Leptostylus (see *monki*)
Melanotus at bait 68
monki, Leptostylus* 106
multipunctatus, Philonthus ... 256

nenuphar, Conotrachelus 68
osborni, Xenorhipis* 73
Philonthus (see *kessleri, multipunctatus*)
Phyllophaga (see *futilis*)
Scarabaeidae 158
Silphidae 132
Staphylinidae, change of name in 255
striata, Gypona 93
Tenebrionidae, Rearing of.... 39
uvaldensis, Acmaeodera* 73
Xenorhipis (see *osborni*)

DIPTERA

Anacimas (see *geropogon*)
annulipes, Callopistromyia ... 65
Asilidae 208
Asphondylia (see *xanthii*)
Atherix (see *variegata*)
Bait, Attracted to 65
Bibio (see *femoratus*)
bilineata, Chlorops 247
Caccocéria (see *cressoni*)
Cacomyia (see *Cacoceria*)
calcaneus, Callinicus 209
Callinicus (see *calcaneus, pictitarsis, pollenia, vittatus*)
Callopistromyia (see *annulipes*)
capax, Pseudohippelates 247
Cecidomyiidae 231
Chloropidae 245
Chlorops (see *bilineata, confluens*)
Chrysoceria (see *Callinicus*)
circumdata, Hippelates 245
circumdata, Siphonella 245
confluens, Chlorops 247
confluens, Diplotoxa 247
cressoni, Cacoceria* 227
Ctenucha (see *fulvicollis*)
dissidens, Hippelates 245
dissidens, Oscinis 245
Diplotoxa (see *confluens, glabricollis, inclinata, messoria*)
Euxesta (see *notata*)
femoratus, Bibio 66
fulvicollis, Ctenucha 275
geropogon, Anacimas* 229
glabricolis, Diplotoxa 247
Hippelates (see *circumdata, dissidens, longulus, particeps, subvittata, texana*)
inclinata, Diplotoxa 247
Lasiopleura (see *longulus*)
Leptidae 55
longulus, Hippelates 246
longulus, Lasiopleura 246
messoria, Diplotoxa 247
Mosquitoes, Malarial 38
Mycodiplosis (see *radicis*)
notata, Euxesta 65
Onocodes (see *incultus*)
Opetiophora (see *straminea*)
Oscinella (see *particeps*)
Oscinis (see *dissidens*)
particeps, Hippelates 246
particeps, Oscinella 245
pictitarsis, Callinicus 209
pollenia, Callinicus 209
Pseudohippelates (see *capax*)
Pseudotephritis (see *vau*)
radicis, Mycodiplosis* 232
Siphonella (see *circumdata*)
straminea, Opetiophora 246
subvittata, Hippelates 246
Synonymy in *Hippelates* and *Diplotoxa* 245
Syrphidae 227
Tabanidae 229, 275
Tabanus at bait 65
texana, Hippellates 245
variegata, Atherix 55
vau, Pseudotephritis 65
vittatus, Callinicus* 209
xanthii, Asphondylia* 231

HEMIPTERA

Aphididae, Nephrocyte cells and their function 169
Bipersona (see *hottesi*)
Chionaspis (see *pinifoliae*)
Cicadellidae 101, 264
coagulata, Homolodisca 265
crassa, Typhlocyba* 102
enascora, Typhlocyba* 103
expanda, Typhlocyba* 104
Homolodisca (see *coagulata*)
Homoptera of Porto Rico and Virgin Islands 88
hottesi, Bipersona* 211
Oncometopia (see *undata*)
Periphyllus (see *utahensis*)
pinifoliae, Chionaspis 5
quadrata, Typglocyba* 102
surcula, Typhlocyba* 103
surda, Typhlocyba* 101
Typhlocyba (see *crassa, enascora, expanda, quadrata, surcula, surda*)
undata, Oncometopia 264
utahensis, Periphyllus 211

HYMENOPTERA

Anacrabro 151
ancylivora, Macrocentrus .. 67
Ants prey of wasps 4
arida, Hesperapis* 183
Bait, Attracted to 67
Bembix (see *spinolae*)
Biological notes on solitary wasps 93
bisoncornua, Coelioxys* 205
briaxus, Mutilla 51
californica, Townsendiella* .. 181
californicus, Myrmecocystus.* 118
carnifex Polistes 9
castaneicolor, Polistes* 12
Cerceris (see *nigrescens*)
ceteri, Crabrones 152
Coelioxys (see *bisoncornua*)
Crabrones (see *ceteri*)
curvispinosus, Pogonomyrmex* 120
Dorymyrmex (see *smithi*)
Encopognathus 153
(see also *pectinatus*)
Entomocrabro 152
Entomognathus 152
Formicidae 118, 171
gibbosus, Philanthus 94
Glypta (see *rufiscutellaris*)
Gorytes (see *similimus*)
Hesperapis (see *arida, rufipes, wilmattae*)
hicksi, Tracheloides* 4
Ichneumonidae 263
idahoensis, Myrmecocystus* .. 118
Iridomyrmex (see *testaceus*)
Karossia 151
kennedyi, Myrmecocystus* ... 119
langstoni, Megaxyela* 131
Lindenius 152
lunator, Megarhyssa 263
Macrocentrus (see *ancylivora*)
Megachilidae 205
Megarhyssa (see *lunator*)
Megaxyela (see *langstoni*)
Monobia (see *quadridens*)
mortuellus, Tracheloides 2
Mutilla (see *briaxus*)
Mutillidae 51
Myrmecocystus (see *californicus, idahoensis, kennedyi, romainei*)
nigrescens, Cerceris 94
pallipes, Polistes 67
palmarum, Polistes* 11
pectinatus, Encopognathus* .. 148
pergandei, Strumigenys 171
Philanthus (see *gibbosus, vertilabris*)
Podalonia (see *violaceipennis*)

Pogonomyrmex (see *curvispinosus*)
Polistes (see *carnifex, castaneicolor*)
Polistes (see *major, pallipes, palmarum*)
quadridens, Monobia 67
Rhectognathus 148
romainei, Myrmecocystus* ... 120
rufipes, Hesperapis 182
rufiscutellaris, Glypta 67
simmillimus, Gorytes 93
smithi, Dorymyrmex* 120
speciosus, Sphecius 67
Sphecidae 2, 93, 147
Sphecius (see *speciosus*)
spinolae, Bembix 95
Strumigenys (see *pergandei*)
testaceus, Iridomyrmex* 121
Townsendiella (see *californica*)
Tracheloides (see *hicksi, mortuellus*)
Tracheloides hicksi hunting ants 2, 4
Velvet ants, Unusual mating of 51
vertilabris, Philanthus 94
Vespidae 7
violaceipennis, Podalonia 96
wilmattae, Hesperapis 184
Xyelidae 131

LEPIDOPTERA

americus, Papilio 269
Archips (see *argyrospila, rosaceana*)
argyrospila, Archips 66
asterius, Papilio 269
Bait, Attracted to 66
californica, Nymphalis 121
carneola, Eustrotia 67
Carpocapsa (see *pomonella*)
Celerio (see *lineata*)
*Cisseps** 275
clorinde, Gonepteryx 189
editha, Lycaena 122
Erebia discoidalis, New record for U. S. 52
Euchromiidae 275
Eulia (see *velutinana*)
Eustrotia (see *carneola*)
fulvicollis, Cisseps 275
Gonepteryx (see *clorinde*)
gravenotata, Lycaena 123
herri, Nymphalis* 121
heteronea, Lycaena 123
idaeusalis, Sparganothis 66
klotsi, Lycaena* 123
lineata, Celerio 189
Lycaenidae 121
Lycaena (see *editha, gravenotata, heteronea, klotsi, montana*)
montana, Lycaena* 122
Noctuidae 268
Nymphalis (see *californica, herri*)
Nymphalidae 52, 121
ocellana, Spilonota 66
Papilio (see *americus, asterius*) .....
Papilionidae 269
Pieridae 189
pomonella, Carpocapsa 66
rosaceana, Archips 66
Scepsis 275
scitula, Synanthedon 67
Sparganothis (see *idaeusalis*)
Sphingidae 189
Spilonota (see *ocellana*)
Synanthedon (see *scitula*)
Taxonomic problems in Lepidoptera 124
Thysania (see *zenobia*)
velutinana, Eulia 66
zenobia, Thysania 268

ODONATA

Aeshnas wanted, Neotropical. 213
Brachymesia (see *gravida*)

Dragonfly mites wanted 189
gravida, Brachymesia 35, 60
Key to genera of American libellulid nymphs 60
Libellulidae 35, 60, 99
linearis, Somatochlora 99
marcella, Miathyria 37
Miathryia (see *marcella*)
ozarkensis, Somatochlora 99
Perithemis (see *seminole*)
seminole, Perithemis 37
Somatochlera (see *linearis, ozarkensis*)

NEUROPTERA

brunnea, Climaciella 72, 87
Climaciella (see *brunnea*)
interrupta, Mantispa 69, 85
Mantispa (see *interrupta, sayi, stryiaca*)
Mantispa interrupta, Mating of 85
sayi, Mantispa 71, 87
stryiaca, Mantispa 71
Mantispidae, Biological observations of 69

ORTHOPTERA

Acrididae 174, 199
altior, Circotettix 200
Circotettix (see *altior, nigrifasciatus, rabula*)
differentialis, Melanoplus 174
Flight-Stridulation in American acridians 199
Melanoplus (see *differentialis*)
Minnesota Orthoptera 154
nigrifasciatus, Circoettix 201
Orthoptera of Arctic-Alpine Zone 13
Phasmidae 267
podura, Timema* 268
rabula, Circotettix 200
Stridulation in American acridians 199
Timema (see *podura*)

STREPSIPTERA

Strepsiptera, Position in classification 257

ARACHNIDA

albineus, Dolomedes 239
brevipes, Pisaurina 244
Dolomedes (see *albineus, okefinokensis, pinicola, scriptus, striatus, tenebrosus, triton, vittatus*)
dubius, Thanatidius 242
dubius, Thomisus 242
lamprus, Teippus 239
Micrommata (see *pinicola*)
Mites parasitic on dragonflies wanted 189
okefinokensis, Dolomedes 239
Pelopatis (see *undulata*)
peregrina, Thaumasia 243
pinicola, Dolomedes 239
pinicola, Micrommata 239
Pisauridae 238
Pisaurina (see *brevipes*)
scriptus, Dolomedes 239
striatus, Dolomedes 242
Teippus (see *lamprus*)
tenebrosus, Dolomedes 239
Thanatidius (see *dubius*)
Thaumasia (see *peregrina*)
Thomisus (see *dubius*)
triton, Dolomedes 238
undulata, Pelopatis 244
vittatus, Dolomedes 238

EXCHANGES

(Continued)

Wanted—Tabanidae (Horseflies and Deerflies). Exchange, purchase, or for determination. G. B. Fairchild, P. O. Box 272, Monticello, Fla.

Exchange.—Lepidoptera of the Western United States for rare American or tropical specimens. C. W. Herr, Woodburn, Ore. R-3.

Wanted—Insects in exchange for Japanese insects or to buy. Tell me your wishes. Hiromu Yamamoto, Matsuo-Kozan. Iwategun Iwateken, Japan.

Would like to exchange Southern California insects for any North American Mutillidae (wingless wasps or velvety ants). Curtis Brown, 2950 G St., San Diego, California.

Wanted.—To get in touch with Specialists who will make determinations for a share of our duplicates. We have many undetermined specimens from all parts of Iowa.—H. E. Jaques, Iowa Insect Survey, Mt. Pleasant, Iowa.

Wanted.—Communication with anyone who has or is collecting Lepidoptera in Burlington County, New Jersey. Also anyone having a microscope for sale.—E. P. Darlington, New Lisbon, N. J.

Wanted for Cash or Exchange.—North American Butterflies in series especially from type localities and remote places. C. F. dos Passos, Mendham, New Jersey.

Wanted—Specimens of North American **Cephidae.** Will make determinations and exchanges for purposes of revising the group. Donald T. Ries, Department of Entomology, Cornell University, Ithaca, N. Y.

ADVANCE IN PRICES

OF ENTOMOLOGICAL LITERATURE PUBLISHED BY THE AMERICAN ENTOMOLOGICAL SOCIETY

The prices of the publications of the American Entomological Society listed prior to 1919 will be considerably advanced after December 31, 1936.

This will be the last chance to secure these papers containing descriptions of many new genera and species, and monographic and revisionary treatments of many groups of insects, at the exceptionally low prices which have not been advanced since the days when the cost of printing was considerably less than it is today.

Those wishing to secure these publications, at present prices should send for Price List 1918, of the orders in which they are interested.

For Systematized Insect Collections

WARD'S UNIT STORAGE SYSTEM
FLEXIBLE — EFFICIENT — SAFE

Long popular for large collections, the Unit System of Insect Storage is now being adopted for many smaller ones. Its primary feature is the pinning of each series of genus or species in separate trays, so that collections can be rearranged or enlarged without necessity of repinning.

Now in stock at Ward's are pinning trays, glass-topped drawers and steel cabinets for the Unit Storage System of Cornell University type and U. S. National Museum type. Complete description and prices on request.

WARD'S NATURAL SCIENCE ESTABLISHMENT, inc.

The Frank A. Ward Foundation of Natural Science of the University of Rochester

READ WARD'S ENTOMOLOGICAL BULLETIN . . . issued monthly

300 NORTH GOODMAN STREET
ROCHESTER . . . NEW YORK

FOR SALE

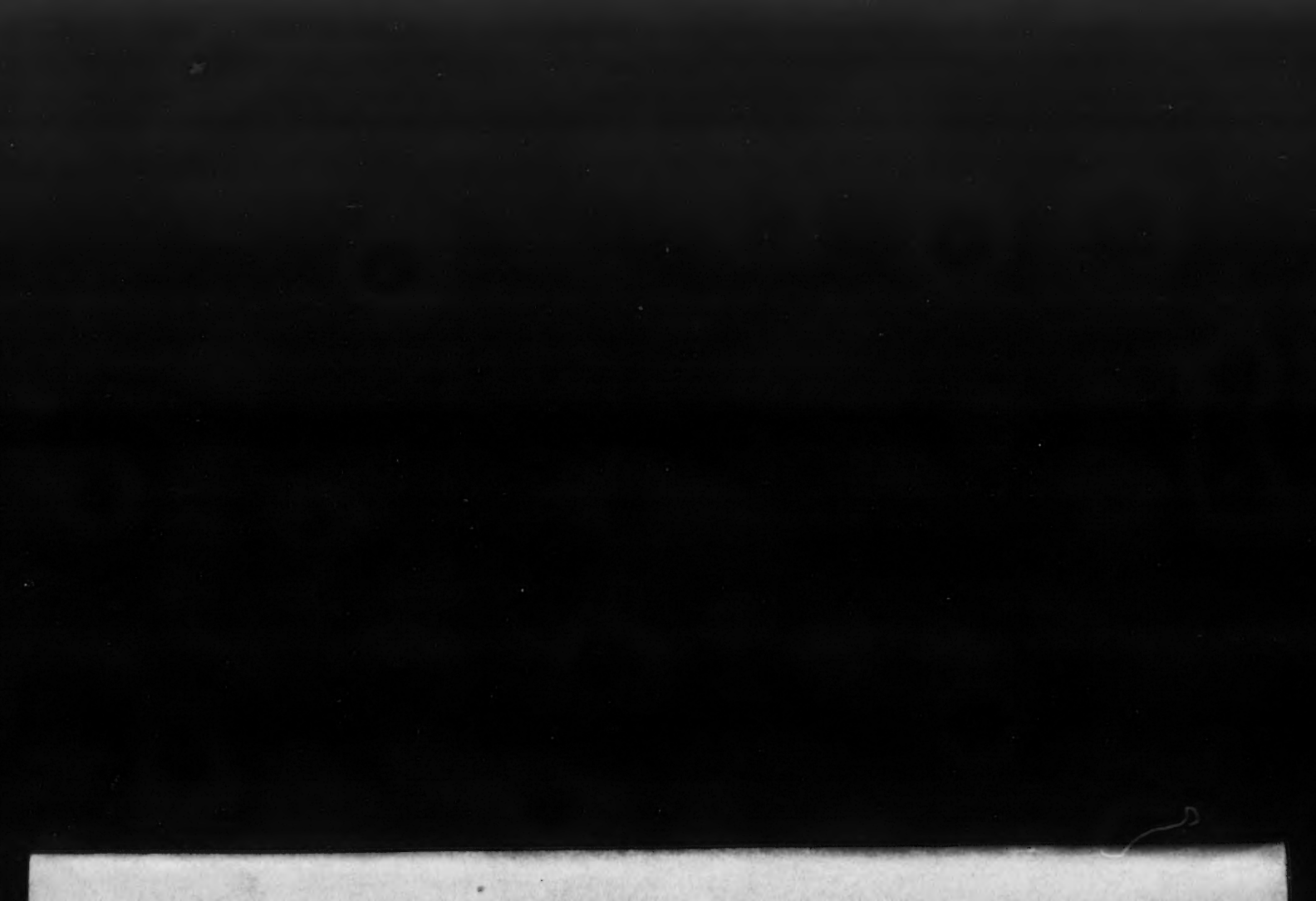
One of the finest collections of Palearctic Diurnals

15,000 specimens in perfect condition, all fully labelled

And including very many of the rarest species and some quite unique. Offered at one quarter the original cost. Full particulars on application. Some thousands of fine Indian Diurnals, in papers named, $6.00 per 100. Fine Morphos from French Guiana, New Guiana Delias in papers (named). A very large number of bred Urania riphaeus etc.

A. FORD,
42, IRVING ROAD, BOURNEMOUTH, ENGLAND

RARE SOUTHERN CALIFORNIA LEPIDOPTERA

Pinned and fully Labelled or in Papers
List furnished on request

CALIFORNIA INSECTARIES, INC.
1612 West Glenoaks Boulevard **Glendale, California**
A. W. Morrill, Ph. D., Mgr. C. Henne, Lepidopteris